Jan 15th, 12:00 PM - 12:45 PM

Session 2 Discussion Notes

Christopher Brown
Marine Information Resources Corporation

Session II Notes
Recent Developments in wave modeling with applications for operations

These notes are intended as a supplement to the Session II presentation. The following discussion points were captured by workshop rapporteurs:

- As researchers assess impacts from the possibility of an ice free Arctic, a new area for coupled modeling involves wave growth and dissipation along ice edges and leads. The interaction of waves with retreating ice reduces ice cover, which in turn increases wave fetch.

- Waves and sea-ice interactions are complex. The sea ice has an impact on the wave field, but the wave field also has an impact on the sea ice.

- Seasonal sea ice is much weaker than long-term (multi-years old) ice.

- Large waves generated in open water propagate through ice and this phenomenon may be happening on a regular basis. Ice begins to break up very quickly owing to wave propagation. Initially sea ice responds mainly to low frequency waves, but as the ice breaks up, higher frequencies prevail.

- Assessments of wave growth in ice may be studied using outside wave tanks such as Ohmsett, the National Oil Spill Response Test Facility. Ohmsett is the largest outdoor saltwater wave/tow tank facility in North America.

- Model verification requirements are dependent upon model resolution and benefit from higher and more uniform spatial coverage of wave observations.

- In some cases, organizations such U.S. Integrated Ocean Observing System, (IOOS®) have enhanced observatories with wave buoy deployments in the coastal ocean.

- Improved spectral observations can be used to better represent swell in wave forecast models.

- Wave observations are being used for assimilation into wave forecast models and verification of wave forecast models. Examples include operational assimilation of altimetry into WAVEWATCH III by Fleet Numerical Meteorology and Oceanography Center and planned data assimilation within a coupling project at NRL Stennis. Similar initiatives are underway at the National Center for Environmental Prediction and the European Centre for Medium-Range Weather Forecasts.

- Verified wave models are essential to understand ocean wave climate and its variability on seasonal to decadal time scales. Observations are crucial to this understanding.

- Increasing the number of directional wave measurements to support WAVCIS will directly lead to improvements in Gulf of Mexico wave modeling technologies and will translate into better wave forecasting techniques for others.

- Wave buoys and models are important to improving our understanding of the role of waves in ocean-atmosphere coupling.

- Ship observations, especially from Polar Regions, may be useful to assessing wave processes and climatic conditions. Databases such as the International Comprehensive Ocean-Atmosphere Data Set (ICOADS) may be particularly useful in the development of climatologies and research on changing ice fields.